

1. A lens assembly adapted to be connected to a CRT and affixed to mounting structure in a projection television cabinet, the lens assembly comprising:

a tubular lens mount having a longitudinal axis and at least a first optical lens element mounted therein along said longitudinal axis,

5 a tubular focus mount connected to said tubular lens mount and extending along said longitudinal axis;

a CRT coupler formed integrally with said focus mount, said CRT coupler including CRT fastening structure for securing the CRT thereto and projection television fastening structure for securing said CRT coupler to the mounting structure with the
10 projection television cabinet; and

a second optical lens element mounted to said CRT coupler.

2. The lens assembly of claim 1, further comprising:

adjustable fastening and locking structure connecting said lens mount to said
15 focus mount and allowing a focus position to be obtained and locked in place between the lens mount and the focus mount.

3. The lens assembly of claim 1, further comprising a generally tubular element configured for securement between said CRT coupler and the CRT, said generally tubular
20 element adapted to receive a coolant fluid.

4. The lens assembly of claim 3, wherein said generally tubular element includes a fill port for introducing the coolant fluid into said generally tubular element.

25 5. The lens assembly of claim 4, wherein said generally tubular element further comprises a flexible bladder.

6. The lens assembly of claim 5, wherein said flexible bladder is formed of a resilient material which expands to accommodate expansion of the coolant fluid when heated
30 by the CRT.

7. The lens assembly of claim 1, further comprising a flange for positioning between the CRT and said CRT coupler, said flange having at least one angled portion configured to set a Scheimpflug angle at which the CRT is adapted to be mounted relative to said longitudinal axis.

8. The lens assembly of claim 7, further comprising first and second seal members for respective positioning between said CRT coupler and said flange and between said flange and the CRT.

9. The lens assembly of claim 8, wherein said first and second seal members are portions of a seal having a generally U-shaped cross section and received by said flange, said first seal adapted for positioning between said CRT coupler and the CRT.

10. The lens assembly of claim 1, wherein said second optical lens element is secured with a clamp plate and threaded fasteners to said CRT coupler.

11. The lens assembly of claim 1, wherein said second optical lens element is secured with a clamp plate and spring clips to said CRT coupler.

12. The lens assembly of claim 1, wherein said CRT coupler includes a fill port for introducing a coolant fluid into a space between said CRT coupler and the CRT.

13. The lens assembly of claim 12, further comprising an expansion bladder communicating with said space, said expansion bladder configured to expand to accommodate expansion of the coolant fluid when the coolant fluid is heated by the CRT.

14. The lens assembly of claim 1, further comprising a clamp plate securing said second optical lens element to said CRT coupler, said clamp plate including a generally

rectangular opening adapted to receive light from the CRT and transmit the light in the form of a generally rectangular-shaped image to said first optical lens element.

15. The lens assembly of claim 1, further comprising a plate positioned on an
5 opposite side of said second optical lens element from the CRT, said plate including a
generally rectangular opening adapted to receive light from the CRT and transmit the light in
the form of a generally rectangular-shaped image to said first optical lens element.

16. The lens assembly of claim 15, wherein said plate is integrally formed with
10 said focus mount and CRT coupler.

17. The lens assembly of claim 1, further comprising a first light stop plate
positioned against a first side of said second optical lens element and configured to prevent
unwanted light transmission in either direction through said second optical lens element.

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18. The lens assembly of claim 17, further comprising a second light stop plate
positioned against a second side of said second optical lens element and configured to prevent
unwanted light transmission in either direction through said second optical lens element.

19. A lens assembly adapted to be connected to a CRT and affixed to mounting structure in a projection television, the lens assembly comprising:

a tubular lens mount extending along a longitudinal axis and having at least a first optical lens element mounted therein along said longitudinal axis,

5 a tubular focus mount connected to said tubular lens mount and extending along said longitudinal axis;

adjustable fastening and locking structure connecting said lens mount to said focus mount and allowing a focus position to be obtained and locked in place between the lens mount and the focus mount,

10 a CRT coupler formed integrally with said focus mount and including a first side facing said tubular lens mount and a second, opposite side for facing the CRT; and

a second optical lens element mounted on said second side of said CRT coupler.

20. The lens assembly of claim 19, further comprising adjustable fastening and locking structure connecting said lens mount to said focus mount and allowing a focus position to be obtained and locked in place between the lens mount and the focus mount.

21. The lens assembly of claim 19, further comprising:

20 a seal positioned against said second optical lens element and configured to seal a space between the CRT and said second, opposite side of said CRT coupler which receives at least a portion of said second optical lens element and is further adapted to receive a coolant fluid.

22. The lens assembly of claim 21, wherein said seal is provided on a generally tubular element configured to receive the coolant fluid.

23. The lens assembly of claim 22, wherein said generally tubular element includes a fill port for introducing the coolant fluid into said generally tubular element.

24. The lens assembly of claim 22, wherein said generally tubular element further comprises a flexible bladder.

25. The lens assembly of claim 24, wherein said flexible bladder is formed of a resilient material which expands to accommodate expansion of the coolant fluid when heated by the CRT.

26. The lens assembly of claim 19, further comprising a flange for positioning between the CRT and said CRT coupler, said flange having at least one angled portion configured to set a Scheimpflug angle at which the CRT is adapted to be mounted relative to said longitudinal axis.

27. The lens assembly of claim 26, further comprising first and second seal members positioned on opposite sides of said flange for respective positioning between said CRT coupler and said flange and between said flange and the CRT.

28. The lens assembly of claim 27, wherein said first and second seal members are portions of a seal having a generally U-shaped cross section which receives said flange.

29. The lens assembly of claim 19, wherein said second optical lens element is secured with a clamp plate and threaded fasteners to said CRT coupler.

30. The lens assembly of claim 19, wherein said second optical lens element is secured with a clamp plate and spring clips to said CRT coupler.

31. The lens assembly of claim 19, wherein said CRT coupler includes a fill port for introducing a coolant fluid into a space between said CRT coupler and the CRT.

32. The lens assembly of claim 31, further comprising an expansion bladder communicating with said space, said expansion bladder configured to expand to accommodate expansion of the coolant fluid when the coolant fluid is heated by the CRT.

5 33. The lens assembly of claim 19, further comprising a clamp plate securing said second optical lens element to said CRT coupler, said clamp plate including a generally rectangular opening adapted to receive light from the CRT and transmit the light in the form of a generally rectangular-shaped image to said first optical lens element.

10 34. The lens assembly of claim 19, further comprising a plate positioned on an opposite side of said second optical lens element from the CRT, said plate including a generally rectangular opening adapted to receive light from the CRT and transmit the light in the form of a generally rectangular-shaped image to said first optical lens element.

15 35. The lens assembly of claim 34, wherein said plate is integrally formed with said focus mount and CRT coupler.

36. The lens assembly of claim 19, further comprising a first light stop plate positioned against a first side of said second optical lens element and configured to prevent
20 unwanted light transmission in either direction through said second optical lens element.

37. The lens assembly of claim 36, further comprising a second light stop plate positioned against a second side of said second optical lens element and configured to prevent unwanted light transmission in either direction through said second optical lens element.

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38. A lens assembly adapted to be connected to a CRT and affixed to mounting structure in a projection television, the lens assembly comprising:
a tubular lens mount having a longitudinal axis and at least a first optical lens element mounted therein along the longitudinal axis,

a tubular focus mount connected to said tubular lens mount and extending along said longitudinal axis;

5 a CRT coupler formed integrally with said focus mount, said CRT coupler including CRT fastening structure for securing the CRT thereto and projection television fastening structure for securing said CRT coupler to mounting structure with the projection television;

a second optical lens element mounted on and sealed against said CRT coupler; and

10 a flexible bladder having a first end which is configured to form a seal against the CRT and a second end which forms a seal against said second optical lens element, and further having a space between said first and second ends which is adapted to receive a coolant fluid.

39. The lens assembly of claim 38, further comprising adjustable fastening and locking structure connecting said lens mount to said focus mount and allowing a focus position to be obtained and locked in place between the lens mount and the focus mount.

40. The lens assembly of claim 38, wherein said flexible bladder is formed of a resilient material which expands to accommodate expansion of the coolant fluid when heated by the CRT.

41. The lens assembly of claim 38, further comprising a flange for positioning between the CRT and said CRT coupler, said flange having at least one angled portion configured to set a Scheimpflug angle at which the CRT is adapted to be mounted relative to said longitudinal axis.

42. The lens assembly of claim 38, wherein said flexible bladder includes a fill port for introducing the coolant fluid into said space.

43. A lens assembly adapted to be connected to a CRT and affixed to mounting structure in a projection television, the lens assembly comprising:

a tubular lens mount having a longitudinal axis and at least a first optical lens element mounted therein along said longitudinal axis,

5 a tubular focus mount connected to said tubular lens mount and extending along said longitudinal axis;

a CRT coupler connected to said focus mount, said CRT coupler including CRT fastening structure for securing the CRT thereto and projection television fastening structure for securing said CRT coupler to mounting structure with the projection television;

10 a second optical lens element mounted to said CRT coupler; and

a flexible bladder having a first end which is configured to form a seal against the CRT and a second end which forms a seal against said second optical lens element, and further having a space between said first and second ends which is adapted to receive a coolant fluid.

15 44. The lens assembly of claim 43, further comprising adjustable fastening and locking structure connecting said lens mount to said focus mount and allowing a focus position to be obtained and locked in place between the lens mount and the focus mount.

20 45. The lens assembly of claim 44, wherein said flexible bladder is formed of a resilient material which expands to accommodate expansion of the coolant fluid when heated by the CRT.

25 46. The lens assembly of claim 44, further comprising a flange for positioning between the CRT and said CRT coupler, said flange having at least one angled portion configured to set a Scheimpflug angle at which the CRT is adapted to be mounted relative to said longitudinal axis.

30 47. The lens assembly of claim 44, wherein said flexible bladder includes a fill port for introducing the coolant fluid into said space.

48. A lens assembly adapted to be connected to a CRT and affixed to mounting structure in a projection television, the lens assembly comprising:

a tubular lens mount having a longitudinal axis and at least a first optical lens element mounted therein along said longitudinal axis,

a tubular focus mount connected to said tubular lens mount and extending along said longitudinal axis;

a CRT coupler connected to said focus mount, said CRT coupler including CRT fastening structure for securing the CRT thereto and projection television fastening structure for securing said CRT coupler to mounting structure with the projection television;

a second optical lens element; and

a clamp plate securing said second optical lens element to said coupler, said clamp plate including a generally rectangular opening adapted to receive light from the CRT and transmit the light in the form of a generally rectangular-shaped image to said first optical lens element.

49. The lens assembly of claim 48, further comprising adjustable fastening and locking structure connecting said lens mount to said focus mount and allowing a focus position to be obtained and locked in place between the lens mount and the focus mount.

50. The lens assembly of claim 49, wherein said generally rectangular opening has a length and a width, and the ratio of the length to the width is one of 4:3 and 16:9.

51. A projection television lens assembly comprising:

a tubular lens mount having a longitudinal axis and at least a first optical lens element mounted therein along said longitudinal axis,

a tubular focus mount connected to said tubular lens mount and extending along said longitudinal axis;

a CRT coupler connected with said focus mount, said CRT coupler including CRT fastening structure for securing the CRT thereto and projection television fastening

structure for securing said CRT coupler to the mounting structure with the projection television cabinet;

a second optical lens element mounted to said CRT coupler; and

a mask having a generally rectangular opening positioned at a location on at least one side of at least one of said first and second optical lens elements and configured to allow the transmission of light through said opening from the CRT.

52. The projection television lens assembly of claim 51, wherein said mask further comprises a coating on said at least one side.

53. The projection television lens assembly of claim 51, wherein said mask further comprises a separate member on said at least one side.

54. A projection television lens assembly comprising:

a tubular lens mount having a longitudinal axis and at least a first optical lens element mounted therein along said longitudinal axis,

a tubular focus mount connected to said tubular lens mount and extending along said longitudinal axis;

a CRT coupler connected with said focus mount, said CRT coupler including CRT fastening structure for securing the CRT thereto and projection television fastening structure for securing said CRT coupler to the mounting structure with the projection television cabinet, said CRT coupler having a space with a first registration element; and

a second optical lens element mounted to said CRT coupler, said second optical lens element having a second registration element and being configured for receipt in said space such that said first and second registration elements mate together to prevent rotation of said second optical lens element relative to said space.